Name: Date:

Polynomial Factoring solution (version 16)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 6x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(6) \pm \sqrt{36 - 132}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-96}}{2}$$

$$x = \frac{-6 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-6 \pm 4\sqrt{6}\, i}{2}$$

$$x = -3 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 2i$ and $-6 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 2i) \cdot (-6 + 3i)$$

$$54 - 27i - 12i + 6i^2$$

$$54 - 27i - 12i - 6$$

$$54 - 6 - 27i - 12i$$

$$48 - 39i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 11x - 12$ in factored form. I'll give you a hint: one factor is $(x + 1)$.**

Solution

	1	2	-11	-12
-1		-1	-1	12
	1	1	-12	0

$$f(x) = (x+1)(x^2 + x - 12)$$

$$f(x) = (x+1)(x-3)(x+4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+3) \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.